

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

A41NM Revision 4 BAE SYSTEMS (Operations) Limited Jetstream Model 4101 November 30, 2001

TYPE CERTIFICATE DATA SHEET NO. A41NM

This data sheet, which is part of Type Certificate No. A41NM, prescribes conditions and limitations under which the product, for which the Type Certificate was issued, meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder: BAE SYSTEMS (Operations) Limited
Prestwick International Airport
Ayrshire, Scotland KA9 2RW

Jetstream Model 4101 (Transport Category Airplane) approved 9 April 1993 (see note 7):

Engines: Left: TPE331-14GR-XXXX Garrett turbo-propeller, reduction gear
ratio 22.97:1, rotates clockwise when viewed from rear.
Right: TPE331-14HR-XXXX Garrett turbo-propeller, reduction gear
ratio 22.93:1, rotates counter clockwise when viewed from rear.

Note: -XXXX = Dash number portion of engine model number (see below)

Engine Model Number	Jetstream Aircraft Modification Number Signifying Installation of Engines Having the Model Number Shown
TPE331-14GR/14HR-801H	None (Original Build Standard)
TPE331-14GR/14HR-802H	None (Original Build Standard)
-803H	JM41278
-804H	JM41278 and JM41312
-805H	JM41278, JM41312, JM41333 and JM41300
-806H	JM41333
-807H	JM41278, JM41312 and JM41333
-901H	JM41465
-808H	JM41278, JM41312 and JM41548A or B
-809H	JM41278, JM41312, JM41333, JM41300 and JM41548A or B
-810H	JM41278, JM41312, JM41333 and JM41548A or B
-903H	JM41465 and JM41548A or B

Engine Limits: Propeller Shaft Torque:
Pre Mod JM41300:
Maximum permissible torque for take-off and continuous operation is
100% (5076 Lb-Ft). This equates to 1119 kW (1500 SHP) at 100% (1552 RPM)
propeller rotational speed.

Post Mod JM41300:
Maximum permissible torque for take-off and continuous operation is
100% (5584 Lb-Ft). This equates to 1230 kW (1650 SHP) at 100% (1552 RPM)
propeller rotational speed

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Engine Limits: (cont.)

Engine Propeller Shaft Rotational Speed:

Maximum for Take-Off, Maximum Continuous and APR operation is 101% (1568 RPM).

Exhaust Gas Temperature (EGT):

Maximum permissible Exhaust Gas Temperature (EGT) at any given time is the displayed EGT LIMIT with Integrated Electronic (engine) Control (IEC) selected ON.

Fuel and Additives:

a. Engine fuels approved for use are as follows:

Kerosene Type:	UK:	DERD 2453 (AVTUR/FSII)* DERD 2494 (AVTUR)
	USA:	ASTM D 1655, Type Jet A or Jet A-1 MIL-T-83133 Grade JP-8*
	NATO:	F34* and F35
	CANADA:	CAN/CGSB-3.22-M86
Kerosene Type:	UK:	DERD 2454 (AVTAG/FSII)*
	USA:	ASTM D 1655, (Jet B) MIL-T-5624, (JP-4)
	CANADA:	CAN/CGSB-3.22-M86 (FSII) CAN/CGSB-3.22-M86
	NATO:	F40*

b. Each of the following additives is approved for use with the fuel and must be to the latest standard of the relevant specification. Fuel marked with an asterisk (*) already contains fuel system icing inhibitor and further additions to those fuels are not permitted.

Icing Inhibitors: Concentrations not to exceed 0.15% by volume.

UK:	DERD 2451 (AL-31)
USA:	MIL-I-27686 ASTM D 1655
NATO:	S748

Biocide: Biobor JF Biocide in concentration not greater than 270 parts per million (20 ppm of elemental boron).

Engine Oil:

The oil capacity for each engine and oil tank combined is:

5.68 liters
1.25 UK gallons
6 U.S. quarts

Oil Specifications:

	<u>USA</u>	<u>NATO</u>
Type II:	MIL-L-23699C	0-156

Brands: Mixing of oil brands is not permitted. The approved brands of oil are: Mobil Jet Oil II, Exxon (ENCO/ESSO) 2380 Turbo Oil, Castrol 5000, Aeroshell/Royco Turbine Oil 500 or 560.

Oil Temperature Limits:

Minimum for Starting	minus 40 °C
Maximum Continuous	110 °C
Maximum	127 °C (5 minute limit)

The minimum permissible oil temperature is 55 °C for all operating conditions other than starting and ground operations.

Oil Pressure Limits:

	Minimum Pressure	Maximum Pressure
Taxi RPM	30 PSI	65 PSI
Flight RPM	45 PSI	65 PSI

If the oil temperature is cold, a transient oil pressure of 85 PSI is permitted during an engine start.

Propellers:

Pre Mod JM41300:

Left: McCauley B5JFR36C1101-*/* -114GCA-0
 Right: McCauley C5JFR36C1102-*/* -L114GCA-0
 Blades: 5

Post Mod JM41300:

Left: McCauley B5JFR36C1103-*/* -114HCA-0
 Right: McCauley C5JFR36C1104-*/* -L114HCA-0
 Blades: 5

- Notes: (1) */* = in the propeller model number denotes a variable alphabetical suffix which gives the modification state of the propeller.
 (2) Mod JK42618 permits post Mod JM41300 propellers to be fitted to airplanes with 1500 shp engines at MTOW of 24,000 lb.
 (3) Mod JK42843 permits post Mod 41300 propellers to be fitted to airplanes with 1500 shp engines at MTOW of 23,000 lb.

Propeller Limits:

Speed Range:

All Operations, 101% RPM.
 Continuous ground operation between 82% and 90% and below 68% rpm is prohibited. Except for takeoff, continuous ground operation is prohibited when the torque is greater than 60% and the wind is greater than 15 kts unless the wind is from within ± 45 degrees of the nose of the airplane.

Diameter (Nominal): 114.0 inches. Reduction to a minimum of 112.0 inches permitted.

Pitch Settings at 42.0 inch radius station:

Maximum Reverse: -15°
 Flight Idle: $+7^\circ$ (pre Mod JM41333)
 $+10^\circ$ (post Mod JM41333)
 Feathered: $+79.7^\circ$

Airspeed Limits: V_{MO}/M_{MO} (Maximum Operating Speed)

$V_{MO} = 250$ KIAS
 $M_{MO} = 0.52$ (above 17,400 ft altitude)

 V_A (Maneuvering Speed - flaps retracted)

$V_A = 180$ KIAS

 V_{FE} (Flap Maximum Extended Speeds)

$V_{FE} =$	170 KIAS	9° Flap (Pre Mod JK42584)
	200 KIAS	9° Flap (Post Mod JK42584)
	160 KIAS	15° Flap
	140 KIAS	25° Flap

$V_{LO} (RET)$ (Landing Gear, Maximum Speed During Retraction)

$V_{LO} (EXT)$ (Landing Gear, Maximum Speed During Extension)

V_{LE} (Landing Gear, Maximum Operating Speed While Extended)

$V_{LO} (RET) = 160 \text{ KIAS}$

$V_{LO} (EXT) = V_{LE} = 170 \text{ KIAS (Pre Mod JK42584)}$

$V_{LO} (EXT) = V_{LE} = 170 \text{ KIAS (Flaps } 0^\circ \text{, Post Mod JK42584)}$

$V_{LO} (EXT) = V_{LE} = 200 \text{ KIAS (Flaps } 9^\circ \text{, Post Mod JK42584)}$

V_{MC} (Minimum Control Speed With Critical Engine Inoperative)

$V_{MC} = 91 \text{ KIAS (Pre Mod JM41300)}$

$V_{MC} = 92 \text{ KIAS (Post Mod JM41300)}$

CG Range:

Pre Mod JM41300:

Weight	Fuselage Station Inches		
	Fwd Limit	Fwd Limit	Aft Limit
	L/G Up	L/G Down	L/G Up/Down
13000	308.35	310.00	322.00
16150	308.35	310.00	-
16834	-	-	329.10
18500	-	-	329.80
23000	321.38	322.54	329.80

Note: Straight line variations between weights and fuselage stations where quoted.

Post Mod JM41300:

Weight	Fuselage Station Inches		
	Fwd Limit	Fwd Limit	Aft Limit
	L/G Up	L/G Down	L/G Up/Down
13000	308.35	310.00	322.00
16150	308.35	310.00	-
16834	-	-	329.10
18500	-	-	329.80
20700	316.82	318.15	329.80
24000	319.61	320.75	329.80

Note: Straight line variations between weights and fuselage stations where quoted.

CG Datum:

The CG datum is defined as fuselage station zero (Stn 0.0). This point is 3.556m (11 ft 8 in) forward of the weighing point which is marked by a screw on the bottom of the fuselage on the aircraft center-line at Stn. 140.

Standard Mean Chord (SMC):

The length of the SMC is 1.770m (69.69 inches). The leading edge of the SMC is 7.798m (307.02 inches) aft of Station 0.0.

Leveling Means:

Leveling beams are mounted at Station 327 on the passenger seat rails. See weight and balance manual.

Maximum Weights:

Pre Mod JM41300:

Condition	Max Wt (kg)	Max Wt (Lb)
Taxi and Ramp	10483	23110
Take-off	10433	23000
Landing	10115	22300
Zero Fuel	9389	20700
Jacking Weight	8981	19800

Post Mod JM41300:

Condition	Max Wt (Kg)	Max Wt (Lb)
Taxi and Ramp	10936	24110
Take-off	10886	24000
Landing	10569	23300
Zero Fuel	9707	21400
Jacking Weight	8981	19800

Minimum Crew:

2 - Pilot and Co-pilot

Maximum No. Passengers:

30

Maximum Baggage/Cargo:

544 kg (1200 lb) in the rear baggage bay.
 159 kg (350 lb) in the ventral pod.
 45 kg (100 lb) in the forward right stowage.
 23 kg (50 lb) in the forward left stowage.
 Or as otherwise placarded on the airplane.

Fuel Capacity:

Fuel Capacity	UK Gal	US Gal	Liters	kg	lb
Usable	727	874	3306	2639	5819
Unusable	4	5	19	15	33
Total	731	879	3325	2654	5852

Maximum Operating Altitude:

25,000 ft

Airplane Operating Temperature Range:

Minimum of minus 40 °C between minus 1000 ft and 16000 ft pressure altitude,
 decreasing linearly to minus 54 °C at 25000 ft pressure altitude.
 Maximum of ISA + 40 °C.

Fuel Tank Temperatures:

The minimum fuel tank temperature is minus 37 °C.
 The maximum fuel tank temperature is plus 49 °C.

Flying Control Surface Angular Travel:

Measured at right angles to the hinge line:

Aileron: 21.4° Up, 14.15° Down

Aileron Trim Tabs: 18.2° Up, 17.75° Down

Flaps:

Take-off 0° with Mod. JM 41400 embodied

9° or 15° with Mod. JK 42493 or JD42525 embodied

Approach 15°

Landing 25°

Elevator:

28° Up, 17° Down

Elevator Trim Tab:

Left: 5.58° Up, 8.4° Down

Right: 5.47° Up, 8.67° Down

Rudder:

± 24°

Rudder Trim Tab:

9.24° Right, 8.25° Left

Operating Limitations:

Aircraft shall be operated in compliance with the operating limitations specified in
 the FAA/CAA approved Airplane Flight Manual Document No. J41.01.

DATA PERTINENT TO ALL MODELS:

<u>Serial Numbers Eligible:</u>	A United Kingdom Certificate of Airworthiness for Export endorsed as noted under "Import Requirements" below must be submitted for each individual airplane for which application for United States certification is made.
<u>Import Requirements:</u>	To be considered eligible for operation in the United States, each airplane manufactured under this Type Certificate must be accompanied by a Certificate of Airworthiness for Export signed by a representative of the United Kingdom Civil Aviation Authority, containing the following statement: "The airplane covered by this certificate has been examined, tested, and found to conform to the type design approved under FAA Type Certificate No. A41NM and is in a condition for safe operation." Only Model Jetstream 4101 airplanes manufactured in the United Kingdom and accompanied by a CAA-UK Export Certificate of Airworthiness are eligible for a United States Certificate of Airworthiness.
<u>Certification Basis:</u>	<p>-Part 25 of the FAR's dated February 1, 1965, as amended by amendments 25-1 through 25-66 (based on the BAe application date to CAA-UK for TC), and</p> <p>-Part 25 of the FAR's amendments numbered 25-67, 25-68, 25-69, 25-70, and 25-71, and</p> <p>-Part 25 of the FAR's sections 25.361 and 25.729 and paragraphs 25.571(e)(2), 25.773(b)(2) and 25.905(d), all as amended by amendment 25-72, and</p>
<u>Certification Basis</u> (cont'd)	<p>-Part 25 of the FAR's, Section 25.1419 as amended by amendments 25-1 through 25-66 of the FAR's (BAe elected to comply with this requirement), and</p> <p>-FAA Special Conditions (SC's) as follows:</p> <ul style="list-style-type: none"> -SC's number 25-ANM-45 issued July 9, 1991 and 25-ANM-45A issued November 8, 1994, Cabin Aisle Width -SC's number 25-ANM-48 issued August 29, 1991, Lightning and High Intensity Radiated Fields (HIRF), and -SC's number 25-ANM-110 issued December 6, 1995, ATTCS power for approach climb performance, see NOTE 8 SC number 25-ANM-129, issued June 5, 1997, Continuous Power Reserve (CPR) System, see NOTE 9 SC number 25-165-SC, issued September 28, 2000, Seats with Inflatable Lapbelts see NOTE 10 <p>-FAA Exemptions as follows:</p> <ul style="list-style-type: none"> Exemption number 5587, head impact criteria (25.562(c)(5)) for the three most forward passenger seats in the passenger cabin, expired March 31, 2001. [Exemption 5587 was issued January 13, 1993]. see NOTE 10. <p>-FAA Equivalent Safety Findings as follows:</p> <ul style="list-style-type: none"> -Section 25.349, flight rolling conditions -Paragraph 25.729(e)(2), landing gear aural warning inhibited whenever the airspeed is greater than 145 knots IAS, and -Paragraph 25.811(d)(2), emergency exit markings, overwing exits, and -Paragraph 25.1182(a), Nacelle areas behind the firewalls, and <p>-Part 34 of the FAR's effective September 10, 1990, and</p> <p>-Part 36 of the FAR's effective December 1, 1969 as amended by amendments 36-1 through 36-18 including Appendices A, B and C</p>

Required Equipment:

The basic required equipment as prescribed in the applicable Federal Aviation Regulations (see "Certification Basis") must be installed in the airplane for U.S. certification. All of the required equipment that must be installed as well as optional equipment installations approved by the FAA are listed in the Jetstream 4100 Master Equipment List (Document No. AWR/063/JM41 as revised and approved by CAA-UK).

Federal Aviation Administration (FAA) approved Airplane Flight Manual (AFM), Jetstream Series 4100 Flight Manual, Document No. J41.01., published in the English language (CAA-UK approved on behalf of the FAA on April 1, 1993 or later CAA-UK approved revisions), is required.

Service Information:

Service bulletins, repair instructions (letters, drawings, specifications, forms used for transmitting repair descriptions, etc.), structural repair manuals, technical/operational responses, vendor manuals, Airplane Flight Manual (AFM), and overhaul and maintenance manuals, which include a statement "CAA Approved" or "CAA Approved, ref DAI/1011/55" are accepted by the FAA and are considered "FAA Approved". These approvals pertain to the Type Design only.

Airframe mandatory inspections and component life limits resulting from investigations and tests for compliance with damage tolerance requirements are listed in the "Airworthiness Limitations" section in Chapter 5 of the JS4100 Maintenance Manual.

Airplane systems and equipment related and engine mandatory Certification Maintenance Requirements (CMR's) are listed in the "Certification Maintenance Requirements" section in Chapter 5 of the JS4100 Maintenance Manual. Material covered in this Section must not be changed without FAA approval.

Available Documents:

- Airplane Flight Manual, Doc. No. J41.01.
- Manufacturers Operations Manual, Doc. No. SA4.4100/MOM/-
- Jetstream 4100 Maintenance Review Board (MRB) report, Doc No. J4100/MRB/1
- JS4100 Manufacturers Maintenance Manual, Doc No. SA4.4100/AMM/-
- Structural Repair Manual, Doc No. SA4.4100/SRM/400
- Wiring Diagrams Manual, Doc No. SA4.4100/WM/-
- Illustrated Parts Catalogue, Doc No. SA4.4100/IPC/-
- Weight and Balance Manual, Doc No. SA4.4100/WBM/-
- Master Minimum Equipment List, Doc No. MMEL-J41-01
- Service Bulletins CAA approved by the authority of CAA-UK authorization Number CAA JA02034 JAR 21 DOA granted to Jetstream Aircraft Ltd. by CAA-UK
- Variant Build Standard, Doc No. JS-4100/VBS XXX/X

NOTE 1.

Weight and Balance:

- a. A current Weight and Balance Report, including list of equipment included in the certificated empty weight, and loading instructions must be in each aircraft at the time of original airworthiness certification and at all times thereafter except in the case of an operator having an FAA approved loading system for weight and balance control. Weight and Balance Manual SA4.4100/WBM/- contains all the loading information required for each aircraft in its delivery configuration.
- b. The airplane must be loaded in accordance with limitations in Chapter 2 of the AFM and the CG must remain within the specified limits at all times.
- c. The airplane empty weight and corresponding center of gravity location must include:
 - Total engine and gearbox oil: 24.50lb at Sta 263.70 in.
 - Total hydraulic fluid: 45.64 lb at Sta 335.60 in.
 - Unusable fuel (32.60 lb) listed as follows:

Unusable Fluid	U.S. Gallons	Pounds	Moment Arm (inches)
Drainable:			
Left Wing	2.28	15.18	337.63
Right Wing	2.28	15.18	337.63
Trapped Fuel:			
Tanks and fuel lines	0.34	2.25	337.63
Total unusable fuel	4.90	32.60	337.63

- NOTE 2. All placards specified in the airplane Maintenance Manual must be installed in the appropriate locations.
- NOTE 3. Mandatory structural inspections, inspection times, and retirement times for structural parts and for components are listed in the "Airworthiness Limitations" section in Chapter 5 of the JS4100 Maintenance Manual, Doc. No. SA4.4100/AMM/-. Material covered in this Section of the Maintenance Manual must not be changed without FAA approval.
- NOTE 4. Mandatory Certification Maintenance Requirements (CMR's) for airplane systems and equipment are listed in the certification Maintenance Requirements" section in Chapter 5 of the JS4100 Maintenance Manual, Doc. No. SA4.4100/AMM/-. Material covered in this Section must not be changed without FAA approval.
- NOTE 5. Mandatory engine Certification Maintenance Requirements (CMR's) are listed in the "Certification Maintenance Requirements" section in Chapter 5 of the Jetstream Model 4100 Maintenance Manual, Doc. No. SA4.4100/AMM/-. Material covered in this Section must not be changed without FAA approval..
- NOTE 6. The CMR's are also included in an appendix to the Maintenance Review Board Document No. J4100/MRB/1.
- NOTE 7. The Jetstream Model 4101 has been granted U.S. Type Certification approval by the FAA and is a variant of the Jetstream Series 4100 airplane approved by the Civil Aviation Authority of the United Kingdom. The minimum acceptable configuration of the Jetstream Model 4101 is defined in Jetstream Aircraft Limited Document No. JS-4100/TBS.FAA/- which is titled "Jetstream Model 4101 Type Build Standard for Type Acceptance in the United States".
- NOTE 8. Installation of the appropriate amendment in the Airplane Flight Manual (AFM) allows published airplane performance to be based on utilization of ATTCS power for compliance with the approach climb performance requirements in § 25.121(d) of the Federal Aviation Regulations.
- NOTE 9. Airplane performance base on use of CPR power for take-off and enroute conditions after failure of one engine will be published in an applicable Amendment to the Airplane Flight Manual.
- NOTE 10. The following BAE Systems modifications are FAA and CAA approved and satisfy FARs §25.785 (a) and §25.562(c)(5) via compliance with FAA Special Condition number 25-165-SC.
JK 42997 (Service Bulletin J41-25-082): Installs an inflatable lapbelt mounted Airbag for each front row occupant, designed to minimize the loads on the passenger from impact with the forward passenger cabin bulkhead or other adjacent structure.
JK 412006 (Service bulletin J41-25-081): Installs improved head pads on the bulkhead.
42967 (Service Bulletin J41-25-075): Compliance with Front Row Passenger Head Impact Requirements.
Part 1: Compliance may be achieved by the accomplishment of service bulletins introducing shoulder harnesses or seatbelt airbags, or through use of certain corporate seating layouts which give adequate clearance from the forward bulkhead/partition. If none of these are embodied part 2 must be carried out.
Part 2: The seat belts on the front single and front double seats are removed. Antimacassars (seat headrest covers) with "Do Not Occupy" labels are introduced to the front single and front seats.
Part 3: If part 2 is accomplished and Service Bulletins, J41-25-064, J41-25-072, J41-25-074 or J41-25-076 are subsequently embodied, Part 3 should be used to remove the changes introduced by Part 2.

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